



(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
13.11.2002 Bulletin 2002/46

(51) Int Cl.7: B23Q 1/00, B23Q 37/00,
B23Q 5/00, B21D 37/02,
B23Q 1/26, B23Q 1/28,
B23Q 1/30

(43) Date of publication A2:
17.03.1999 Bulletin 1999/11

(21) Application number: 98115911.4

(22) Date of filing: 24.08.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 02.09.1997 US 921823

(71) Applicant: Northrop Grumman Corporation
Los Angeles, California 90067-2199 (US)

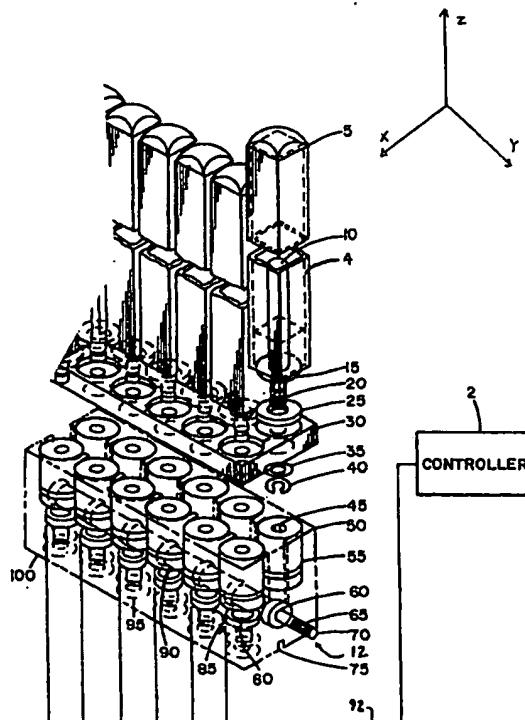
(72) Inventors:
• Hass, Edwin G.
Sayville, New York 11782 (US)

- Sullivan, Edward V.
Huntington Station, New York 11746 (US)
- Schwarz, Robert C.
Huntington Station, New York 11743 (US)
- Kesselman, Martin
Commack, New York 11725 (US)
- Kuhn, Gary E.
Arlington, Texas 76012 (US)
- Papazian, John M.
Great Neck, New York 11020 (US)

(74) Representative: Beetz & Partner Patentanwälte
Steinsdorfstrasse 10
80538 München (DE)

(54) Modularized parallel drivetrain

(57) The invention resides in a module used in conjunction with other such modules in an apparatus for rapidly producing an article having a three-dimensional design comprising a base (50), a plurality of translating members (5) mounted on said base and said plurality of translating members movable relative thereto, the base is an interconnectable block of parallel drivetrain elements having a single input shaft (65) and a series of parallel output shafts (45) at right angles to the input shaft whose power flow to the output shafts is connected/disconnected electrically via electromagnetic clutches (55).





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 11 5911

DOCUMENTS CONSIDERED TO BE RELEVANT												
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)									
A,D	US 5 546 784 A (HAAS EDWIN G ET AL) 20 August 1996 (1996-08-20) * the whole document *	1-10	B23Q1/00 B23Q37/00 B23Q5/00 B21D37/02									
A,D	US 5 546 313 A (MASTERS WILLIAM E) 13 August 1996 (1996-08-13) * the whole document *	1-10	B23Q1/26 B23Q1/28 B23Q1/30									
A	EP 0 442 036 A (MORITA IRON WORKS) 21 August 1991 (1991-08-21) * the whole document *	1-10										
A	US 114 328 A (GRAFTON T. NUTTER) 2 April 1871 (1871-04-02) * the whole document *	1-10										
A	US 1 141 640 A (P.D.E. HUGUENIN) 1 June 1915 (1915-06-01) * the whole document *	1-10										
A	US 4 212 188 A (PINSON GEORGE T) 15 July 1980 (1980-07-15) * the whole document *	1-10										
	-----		TECHNICAL FIELDS SEARCHED (Int.Cl.6)									
			B21D B23Q									
<p>The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search MUNICH</td> <td>Date of completion of the search 16 September 2002</td> <td>Examiner Müller, A</td> </tr> <tr> <td colspan="2">CATEGORY OF CITED DOCUMENTS</td> <td> T : theory or principle underlying the Invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document </td> </tr> <tr> <td colspan="2"> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document </td> <td></td> </tr> </table>				Place of search MUNICH	Date of completion of the search 16 September 2002	Examiner Müller, A	CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the Invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		
Place of search MUNICH	Date of completion of the search 16 September 2002	Examiner Müller, A										
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the Invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document										
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document												

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 98 11 5911

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-09-2002

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 5546784	A	20-08-1996		DE 69523172 D1 DE 69523172 T2 EP 0796155 A1 ES 2161917 T3 WO 9617697 A1		15-11-2001 06-06-2002 24-09-1997 16-12-2001 13-06-1996
US 5546313	A	13-08-1996		NONE		
EP 0442036	A	21-08-1991		JP 2774976 B2 JP 3238127 A AT 116881 T AU 5716690 A CA 2018903 A1 DE 69015995 D1 DE 69015995 T2 EP 0442036 A2 ES 2069646 T3 KR 169973 B1 US 5187969 A		09-07-1998 23-10-1991 15-01-1995 22-08-1991 13-08-1991 23-02-1995 31-08-1995 21-08-1991 16-05-1995 18-02-1999 23-02-1993
US 114328	A			NONE		
US 1141640	A			NONE		
US 4212188	A	15-07-1980		NONE		